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Identifiers-CIPP Model

This Stufflebeam-Guba CIPP type model for the evaluation of innovations in education attempts to maximize the effectiveness of critical decisions through the timely reporting of relevant information in a useful form to appropirate levels of decision making. Evaluation is thus seen as the combination of effective decisions based on timely, relevant information. The system focuses on four classes of decisions and is designed to yield four kinds of information to serve those decision situations. These four kinds of evaluation are context evaluation, design evaluation, process evaluation, and product evaluation. Context evaluation consists of planning decisions and the context information that serves them. It deals with the setting of priorities and the selection of strategies. Design evaluation entails structuring decisions which depend on design information. In this phase, objectives are specified and means to attain them are selected. Process evaluation deals with the possible need to restructure the program after results of pilot testing and previous evaluations are in. Product evaluation considers evidence about the program's effectiveness in attaining its overall goals. Problems in applying this system might include identifying decisions and decision makers, timing decisions, identifying relevant information, and reporting information in a useful form. (TT)

AN OPERATIONAL APPLICATION OF THE STUFFLEBEAM - GUBA CIPP MODEL FOR EVALUATION

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Introduction

This paper is concerned with systematic evaluation of innovations in education. Other kinds of evaluation are important, but they are out of the scope of this presentation. The evaluation system which this paper is about refers to innovative projects that are planned, designed, and validated. The paper rests on several assumptions that will not be argued, except indirectly in an explanation of the evaluation system. The most important assumptions are listed below.

*1. Evaluation is different from measurement.

2. Research designs are inadequate and inappropriate for most evaluation purposes.

3. Systematic evaluation is needed <u>before</u> objectives of an innovative project are designed.

4. Effective evaluation cannot be performed <u>solely</u> by either an outside organization or a separate division within an organization.

It should not be concluded from the preceding assumptions that reliability and validity in evaluation can be compromised, but rather that new methods are needed to effect them.

The presentation will first describe an evaluation system and how it functions. Then attention is turned to problems of application of the system.

An Evaluation System

The evaluation system described here is an adaptation, developed by the Southwest Educational Development Laboratory, of the Stufflebeam-Guba CIPP model.** The major objective of this system is to maximize the effectiveness of critical decisions that are made in an organization through the timely reporting of relevant information in a useful form to appropriate levels of decision-making, in order to optimize planning and development activities. Thus, evaluation is seen to be the combination of effective decisions based on timely, relevant information. The system focuses on four general classes of decisions and is designed to yield four general kinds of information to serve those decision situations. The four kinds of evaluation, called context evaluation, design evaluation, process evaluation, and product evaluation, are described as follows.

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*Those interested in arguments for these assumptions are referred to the symposium on "The World of Evaluation Needs Reshaping," AERA, Saturday morning February 8.

** Developed by Dan Stufflebeam of Ohio State University and Egon Guba of Indiana University.

Context Evaluation

Context evaluation consists of planning decisions and context information that serves them. In planning a new project two important kinds of planning decisions are encountered.

1. The first is the selection of problem components that will be attacked, e.g., setting priorites.

2. A second kind of planning decision is the selection of a strategy (or strategies) that would be used to attack the given problem(s).

To serve problem priority decisions (the first kind), the information needs include knowledge both of constraints of the organization and of the conditions that exist in the general problem area, assuming that not all components of the problem could be attacked initially. The information gathering tasks are to identify the set of problems and problem components which might be attacked in order that priorities can be established. An important weakness in many planning phases is the failure to identify the relatively few problems or problem components that effectively can be attacked, thus identifying others that are not primarily under attack or which will be left to a later date.

In the case of strategy selection (the second kind of decisions), the information needs are to identify resource constraints and to describe general strategies, methods, or approaches that might be used to attack the problems in question. Again the decision task is to select from among the several available strategies one or more that are most appropriate in view of the resource constraints, thus consciously rejecting other strategies that might have been used.

The major sources of context information are research surveys, the literature, and expert opinion. For example, suppose a project is being planned in the general problem area of doing something about the needs of young children. In identifying organizational constraints, it might be determined that the organization is best suited to educational attacks. Then by conducting research surveys on educational problems of young children, by reviewing research literature and activities of early childhood education projects, and/or by obtaining advice of experts in child development, an array of general problem areas might be outlined which could be attacked. The priority decision might limit the problems to those of intellectual needs and language needs. Then, after identifying the resource constraints (that is, the amount of money, the availability of personnel, and the length of time), several strategies might be considered that would better meet the intellectual and language needs of young children. These might vary from instruction for the mother of the child to setting up a boarding school for children. However, by reviewing both strategies that have been used by others and those that can be proposed by experts, the decision-makers can select a strategy that would be feasible. It would need to be considered in the light of resource constraints and support a reasonably good rationale for its selection over other strategies.

Design Evaluation

Design evaluation entails structuring decisions which depend on design information. Structuring decisions are made in the same manner as a blue-

print or set of specifications is designed. Both ends and means need to be structured in detail; that is, the objectives need to be specified operationally if possible, and activities or means of attaining them need to be specified. Information needs include evidence from content or behavioral fields, combined with the knowledge and ingenuity of experts.

To continue the example, suppose a strategy in early childhood education is that of instructing mothers, who would in turn improve the intellectual and language development of their children. The general strategy would postulate long-range goals for intellectual and language development of the children. Therefore, the task of structuring would focus on objectives and activities for training the mother to interact with her child. Research evidence about effective instructions of mothers, information from other projects, and the knowledge and ingenuity of experts in learning theory, child development, etc. would be important information needs in making the structuring decisions.

Process Evaluation

After a design has been structured and is put on trial, often called the pilot test, restructuring decisions are faced. Restructuring decisions are based on process information. Process information consists of the evidence needed to determine effectiveness in attaining the objectives and other information about how the test is being conducted. Although evidence that determines the extent to which objectives are attained is important, it often is not helpful in suggesting the kinds of revisions that might be made when objectives are not attained satisfactorily during the trial. Other information, such as the length of time an activity requires and impressionistic information about the trial, can be useful in determining in what ways the design may be restructured. The major question is what information would be useful in determining how to restructure in order to get a design that will meet its specifications during the trial. Designers and evaluators need to consider very carefully what information would cause them to change the original design, then plan a system of information gathering that will obtain the needed information. This might entail gathering baseline observations or test results against which effects at given times can be compared, as well as comparing the stated objectives with observed effects. It may or may not entail observations or tests with comparison or control groups, depending on the length of time for each trial. Such controls would only be necessary if there was reason to suspect that other subjects might attain the objectives through maturation or some other factor involved in the passing of time. This may not be the case during pilot test when small increments of time are involved.

The point can be illustrated by extension of the example previously used. An objective of instruction of mothers might be that each mother would spend at least one hour each day interacting with her children. The designed activity might be a discussion emphasizing the importance of such interaction combined with a role-playing demonstration. Evidence from follow-up observations might reveal that the objectives were not adequately obtained. Therefore, impressionistic information from the discussion leader and the role-playing leader, as well as from the mothers involved, might reveal the reason for failure and suggest ways to redesign the session. The use of process information obtained during design, trial, and redesign enables components of a larger program to be built.

Product Evaluation

After components of a design have been tested, they can be put together in a program for a product or field test. Since this is the first full-cycle test, the major decisions faced are whether to recycle through another full-scale field test. The information needed, called product information, entails not only evidence about effectiveness in attaining short- and long-range goals, but also effectiveness over a several-month or year time period compared with that of another program or strategy. The attempt here is to obtain convincing evidence that the program will attain its objectives and, moreover, that those objectives are worthy and reasonable when compared with other methods. Product information should also include the resources and cost needed to make the program effective.

In the example, mothers would attain (or fail to attain) objectives set forth for them in the time prescribed; and effects on their children would become evident through evidence that was accumulated. This evidence on the children would be used to validate the original strategy when comparing effectiveness with other programs or the situation as it existed without such a program.

Analysis

It may be argued that this system is too extensive for certain evaluation purposes. Obviously it is foolish to spend $10,000 evaluating a $5,000 project; but the contention here is that the use of this system will enable the designers of a project, whether it be a $10,000 project for six months or a $1,000,000 project for one year, to plan, design, and test more systematically and more efficiently than they could with a less systematic approach. The time and resource constraints (including financial), identified in the first stages of planning, should be the guide to the degree of sophistication one might reach in applying the model through each phase. However, a systematic approach in identifying major decisions and information on which those decisions can be based will produce a more effective design with the least amount of effort. Figure 1 summarizes in a matrix the nature of decisions, the kinds of information, and the sources of information called for in the system.

A flow chart is presented in Figure 2, which details the use of the evaluation system. The initial context evaluation phase is described in any good proposal. Information is drawn from the "educational domain," that is, the general setting and the world of research and experimentation. But many proposals are designed to "get the money," and thus planning may be "skimpy." This is understandable and satisfactory in the light of communication about funding dates and costs for proposals, which often impose unrealistic time constraints. However, in such cases, a context evaluation should be conducted following submission of the proposal, since poor planning (inadequate definition of problem areas and selection of strategy) spells the early doom of many projects.

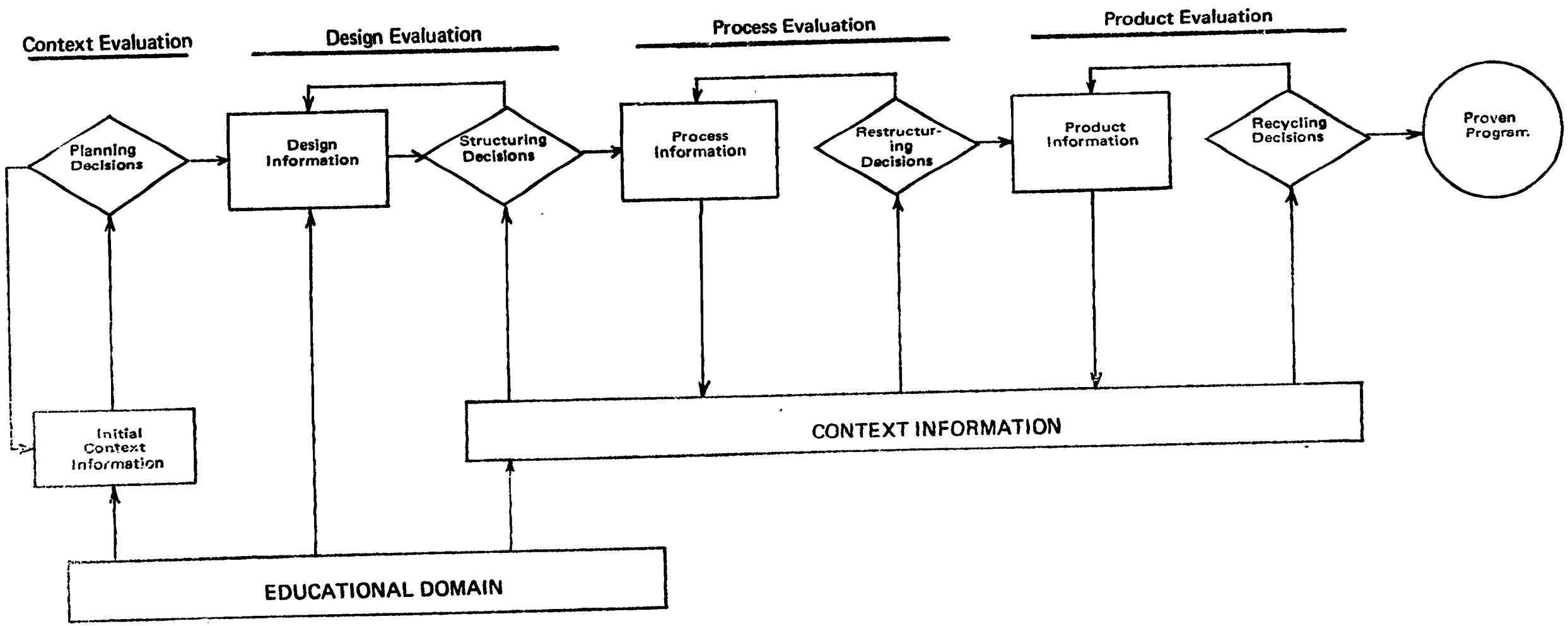
Although not specifically shown in the flow chart, the information accumulated and used at each stage is passed on to the next stage and used along with new information that is obtained. That is, the information is always cumulative. It can be noted that as each kind of information is collected (e.g., design, process, product), provision is made to return to the "educational domain" to supplement the information. That is, new research

Figure 1

Decision - Information Matrix

Decisions	Kinds of Information	Source of Information
Planning	**Context**	
Problem Selection	Organization Constraints, Nature of Conditions, Setting	Policymakers, Research Surveys, Experts
Strategy Selection	Resource Constraints, Criteria, Alternative Strategies, Methods, Approaches	Funding Sources, Reported Research, Experts
Structuring	**Design**	
Component Objectives	Tested goals, Theory, Models	Research reports, Experts
Component Activities	Tested procedures, Educated guesses, Intuitive hunches	Research reports, Experts
Restructuring	**Process**	
Component Objectives	Effectiveness evidence	Subjects, Participants
Component Activities	Practicality of use, Tested Procedures	Participants, Research
Recycling	**Product**	
Multiple Components	Comparative Effectiveness evidence	Observation and Testing of subjects, controls, and/or methods

FIGURE 2
*CDPP EVALUATION SYSTEM FLOW-CHART



*Context, Design, Process, and Product (CDPP), developed by Southwest Educational Development Laboratory, based on work of Daniel Stufflebeam of Ohio State University and Egon Guba of Indiana University

and emerging innovations are monitored and fed to the system. All the information, after its initial use, is maintained in the continuing context information component.

Problems of Application

Having described the evaluation system and outlined the way it functions in an organization, let us turn our attention to the problems that are encountered in its application. The key to the effective operation of the system is that decisions are identified along with persons who are involved in the decision process. Then a systematic attempt is made to get relevant, timely information in a useable form to the decision-makers. The assumption is that the most effective decisions are those based on the best information. Hence, the task is to get the best information to the decision-makers in the time that is available. However, in operation this task poses some serious problems.

Identifying Decisions

Decisions that are faced are not always easily recognized. Often decision-makers themselves are not fully aware of the decisions they may face. In introducing new information, the evaluation system may focus attention on decisions that were not previously considered. Hence, the system must provide persons who are in contact with key decision-makers and are continually alert to decisions that will be faced.

Another problem in identifying decisions and their nature is that decision criteria may change as time passes. New developments occur; new information is obtained; conditions change as time goes by. Any one of these can cause new criteria to appear or old ones to be of no effect. Hence, the system must provide for a continual reassessment of criteria that may affect decisions.

The passing of time may also cause constraints to change. Since there is always some lag between the time when decisions are identified and the time when information is collected, processed, and reported, the system must continually be alert for changes in constraints that might change the basis on which decisions will be made.

Identifying Decision-Makers

Another problem is the identification of persons involved in the decision process. These include not only those who have final authority in making decisions but others involved in the decision process who may influence the final decision-maker. Typically, the decision process in an organization involves a complex network of persons who have varying degrees of influence on the one who may have constituted authority to make any given decision. Hence, it may be useless to get information to the recognized, final decision-maker, in that he either may have little time for considering the information or may rely heavily on the judgment and recommendation of other people. Therefore, the evaluation system must identify the key persons involved in any strategic decision and make arrangement for getting necessary information to these people.

Timing of Decisions

The best information is of utterly no use if it does not arrive in time to base a decision on it. Therefore, the key for the operation of an evaluation system is to get the best information possible in the time that is allowed. Of course, it is possible to postpone the time of the decision, but often such a delay is not possible. Hence, the system must respond to the time when critical decisions will be made and yield the information needed in time for it to be considered.

Identifying Relevant Information

It is not enough for evaluators to decide what information would be best on which to base the decision. Cues must be taken from the decision-makers as to what information is relevant to their decision tasks. It is useless to force sophisticated information upon a decision-maker who fails to see its relevance, since he will ultimately disregard it in favor of more understandable, if less relevant, information. The system can be designed to educate decision-makers to the usefulness of certain kinds of information, but the final criterion must be that the decision-maker considers the information relevant. Otherwise, the best information will have little, if any, effect on the decision.

Reporting in a Useful Form

Another problem related to the relevance of information is to get the information to the appropriate decision-makers in a form that is most useful to them. This entails not only varying the degree of sophistication but also the degree of specificity of reports. The criteria must include the length of the time the decision-maker will likely have to consider the information as well as his competence in understanding the terminology and techniques used to present the information. Thus, the same information may be presented in several different forms to different decision-makers.

It is obvious from the preceding discussion that communication and interaction with key decision-makers is a cornerstone on which effective evaluation rests. We tend to make many unwarranted assumptions about the effectiveness of our communications. One of the hazards of written communication is that the writer has little control over who will read his paper, what psychological set they will have as they read it, or how they will interpret it. Furthermore, he has no chance to interact or clarify his meaning or intent with many of the readers. Therefore, the more visual and oral cues and face-to-face interaction that can accompany his written communications, the more chance he has of being understood. Such research as we have on communication suggests that we are more likely to fail to be understood than to communicate effectively if we depend on any single sensory perception.

The real test of this system is the extent to which it alerts decision-makers and evaluators to the nature of decisions faced and services those decisions with relevant, timely information in a useable form.